

03-04-10

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF HAWAII

----- In the Matter of -----)	Docket No. 2008-0273
)	
PUBLIC UTILITIES COMMISSION)	
)	
Instituting a Proceeding to Investigate the)	
Implementation of Feed-in Tariffs)	
_____)	

HAWAII RENEWABLE ENERGY ALLIANCE RESPONSE
TO
INFORMATION REQUESTS FROM NRRI AND NREL
ON
BEHALF OF THE COMMISSION
AND
CERTIFICATE OF SERVICE

PUBLIC UTILITIES
COMMISSION

2010 MAR -4 P 4: 01

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HAWAII RENEWABLE ENERGY ALLIANCE RESPONSE

INFORMATION REQUESTS FROM NRRI AND NREL

ON

BEHALF OF THE COMMISSION

Per the request in the Commission's letter, dated February 19, 2010, the Hawaii Renewable Energy Alliance ("HREA") respectfully offers its response to Information Requests ("IRs") prepared on behalf of the Commission by the National Regulatory Research Institute ("NRRI") and the National Renewable Energy Laboratory ("NREL"):

By way of introduction, HREA is not providing a response to PUC-IRs 301 through 332, as these IRs were directed to HECO, or to PUC-IRs 340 and 341, as these two IRs were directed to Sopogy; or to PUC-IR-342, as it was directed to Zero Emissions Leasing LLC. We also do not have any comments on the aforementioned IRs at the present time.

Therefore, our response is to PUC-IRs 333 through 349 as provided on the following pages.

PUC-IR-333 – To HECO Companies, SA, and HREA

Do owners of Tier 1 projects, such as residential PV solar systems, typically use debt to finance projects? If so, is such debt financing available? If so, under what typical debt rates and terms? If not, what are the typical sources for financing Tier 1 projects?

HREA Response:

First, HREA defers to the Solar Alliance on their response to this IR with respect to PV solar systems. With respect to wind projects, at the present time HREA is not aware of any financing programs available in Hawaii that are targeted to support wind projects.

In general, we believe that most of the small wind turbines that have been installed to date in were not financed, but were outright purchases. This is characteristic of an “early adopter” market that perhaps is starting to transition. This, in part, suggests that financing vehicles will evolve over time, but for now buying a wind turbine might be viewed much like buying a car. Reinforcing this view is the perspective that homeowners will want to pay off their loans in five to seven years, such that when it comes time to sell their home, the wind turbine would come unencumbered with the home. This rationale for our analysis of a seven year, residential loans is supported further by anecdotal evidence that the average time a homeowner lives in his home about seven years.

Short-term loans, however, are hard to find. One company, Aqua Finance, based in Wisconsin, has a financial entity that may offer financing options for wind dealers to provide financing for wind systems (http://www.aquafinance.com/installment_loans/). So far we are not aware that any wind turbines have been financed in this manner. However, the loan period is only up to 60 months, and the interest rates can vary from 5.99% to 9.99% to 17.99%, depending on the purchaser's credit rating. Basically, this appears to be like buying a wind turbine on a credit card.

Some homeowners may be able to secure a home equity loan with better terms. How realistic is this? For sure, the recession has made home equity loans less available and harder to qualify for. We hope this will become an option as financing vehicles evolve in Hawaii. Another potentially-viable option might be one or more of several government-sponsored programs that are being considered, either via bonds or property tax assessments. However, the point is that none of these programs are available now.

Thus, we stand on our assessment that the seven year loan in our analysis at 9% is a reasonable proxy for what might happen in the residential market, as well as a 10 year loan for small-commercial projects.

PUC-IR-334 – To HECO Companies and HREA

Under the HECO Companies' proposed model, would the total cash flow for any of the proposed Tier 1 and Tier 2 rates be negative for a calendar year? Please describe any such instances.

HREA Response:

Short answer is "yes."

Examples, from our January 21, 2010 filing:

- 1) Skystream 2.4 kW – commercial with 5 year loan; in the red from year 2 through 6.
- 2) Skystream 4.8 kW – commercial with 10 year loan; in the red from year 7 through 10.
- 3) Bergey 10 kW – residential with 7 year loan; in the red from year 2 through 20.
- 4) Bergey 10 kW – commercial with 10 year loan; in the red from year 2 through 6.
- 5) Northern Power 100 kW – commercial with 10 year loan; in the red from year 7 through 10.

We would also like to observe that these negative cash flows will have a negative impact on the consumer uptake of wind technology in Hawaii. We might also conclude the prices are still too low, i.e., higher prices would reduce the amount of negative cash flow.

PUC-IR-335 – To HECO Companies and HREA

Did the HECO Companies assume the same wind speed and thus capacity factor for Tier 1 and Tier 2 wind projects? Would such projects have different elevations such that they would experience different wind speeds? How would the wind speeds differ for Tier 3 projects based on hub height?

HREA Response:

No. As indicated in our IR response on January 21, 2010, HECO assumed higher wind speeds and taller towers which contributed to higher capacity factors. Those factors, in turn, resulted in much lower proposed FIT payment rates than estimated by HREA. To be clear, we have recommended the same reference wind conditions for Tier 1 and Tier 2, i.e., 12 mph at 10m measurement height. We also specified the tower heights by turbine that we analyzed, i.e., 10m (32.8ft) for the Skystream, 18.3m (60ft) for the Bergey10 kW and 37m (121ft) for the Northern Power 100kW.

For Tier 3, HREA is inclined to recommend the same reference wind conditions, i.e., 12 mph at 10m measurement height. Given that, the individual wind speeds at hub height will depend on the specific turbine, such as the Northern Power 100 kW or the GE 1.5 MW. In the case of the Northern Power, the capacity factor would be the same as estimated for Tier 2, i.e., 29.7%. Subject to further analysis, in the case of the GE 1.5 MW with a 67m (220ft) hub height, the capacity factor would be on the order of 39%.

PUC-IR-336 – To HREA

In what year was each of the wind projects listed on page 5 of HREA's Comments and Recommendations Regarding HECO's FIT Tariff Filing and Certificate of Service installed? Have costs for small wind turbines changed in recent years? If so, how?

HREA Response:

The referenced list of wind projects was prepared by HECO. We do not know when they might have been installed. That said, turbine costs in general have gone up in recent years due to a number of factors including increased material and labor costs in manufacturing, higher shipping costs, higher permitting costs, higher installation and commissioning costs and higher operating costs.

For example, major contributors to the increase cost in manufacture ring are due to larger increases in the price of steel and copper. Employee health insurance costs have gone up significantly.

In Hawaii, costs have gone up due to permit projects, especially where conditional or special use permits are required by the counties or the state. For Tier 1 and 2 wind projects, most developers will be looking to site projects on private, agricultural land which normally don't require conditional or special permits. However, the County of Hawaii now requires a Special Use Permit for wind projects 100 kW and larger on private, agricultural land. This has the potential to increase installed costs by \$100K or more.

Finally, it is clear to HREA that an increasing number of Tier 1 and Tier 2 projects will be subject to interconnection requirements studies ("IRSs"). We understand that the cost of an IRS can be \$100K or more. Given this uncertainty to developers, we reiterate our recommendation that the utility bear these costs. For example, given increased permitting costs and an IRS, the cost of a 100 kW wind project could go from \$550K to \$750K or more.

See also our response to PUC-IR-339.

PUC-IR-337 – To HREA

Please provide a full and detailed narrative explanation and any supporting documentation for why the Jacobs 20-kW and Aerostar 30-kW turbines "are not being seriously considered by industry for Hawaii at this time."

HREA Response:

Regarding the Jacobs 20 kW, as noted in our January 21, 2010 filing we:

- a. Need detailed cost and performance data
- b. Can't verify performance, i.e., CF at 12 mph (at 10m) resource site
- c. Can't confirm the number of turbines deployed, where, and their performance
- d. Observed that Jacobs historically have not done well in high-speed wind areas in Hawaii circa 1980s to early 2000.

Regarding the Aerostar 30 kW, as noted in our January 21, 2010 filing, we

- a. Need detailed cost and performance data is not available
- b. Can't verify performance, i.e., CF at 12 mph (at 10m) resource site
- c. Can't to confirm the number of turbines deployed, where, and their performance
- d. Believe this to be a new turbine in the market place

In short, as of this date, because of the above, we cannot complete an analysis of the costs and performance of these turbines. Perhaps, there is some additional information available, and we reserve the right to review said information at a later time.

There are also other concerns. Both the Jacobs and the Aerostar have speed increasing gearboxes, while the Skystream, Bergey, and Northwind units do not. Small wind turbines with gearboxes have had lower reliability and higher O&M costs than those with direct drive generators.

In addition, Jacobs suffers from a poor reputation in Hawaii due to the reliability problems with the windfarms in the mid-1980's. Hundreds of Jacobs 20 kW turbines were installed in these projects and they experienced significant operational problems. In large part, this was due to their design for the smoother wind conditions experienced in the Midwest.

Aerostar suffers from the opposite problem. There is no experience in Hawaii with these turbines and very limited experience elsewhere (estimated 5-10 units in operation), so perceived risks are high.

Also, it is worth pointing out that the industry considers the Jacobs 20 kW to be “underpriced” in the market because Wind Turbine Industries (“WTI”) was able to buy the design, tooling, and significant production inventory for pennies on the dollar when Jacobs Wind Electric went out of business in 1987. If WTI were to modernize the design to increase reliability and lower O&M they would incur significant costs and would likely have to raise prices to remain viable.

PUC-IR-338 – To HREA

Please provide a full and detailed narrative explanation and any supporting documentation for why the appropriate debt term for Tier 1 projects is ten years, as stated on page 9 of HREA’s Comments and Recommendations Regarding HECO’s FIT Tariff Filing.

HREA Response:

Referring back to our response to PUC-IR-333, we discussed why we believe a seven year loan term is appropriate for residential systems. The same basic logic applies to small commercial applications which have both equity and debt partners. In fact, in today’s financial market, financing will be difficult for these projects as well. In the very near term, it will be those developers who have internal financing available will be the likely participants.

Given these factors, we stand on our assessment that the 10 year loan in our analysis at 9% is a reasonable proxy for what might happen in the small-commercial segment of the Tier 1 market.

PUC-IR-339 – To Solar Alliance and HREA

According to page 8 of the HECO Companies' proposed Schedule FIT Tier 1 and Tier 2 Tariff and Agreement:

"Development costs, permitting costs, and interconnection & electrical costs for Tier I were developed from the NREL Bergey study, which details the line-by-line cost of installation of 10-kW Bergey turbines at a variety of locations in the Pacific Northwest."

Were the interconnection costs developers incurred in the NREL study comparable to those that the HECO Companies propose? How else might the costs in Hawaii be different from those in the Pacific Northwest? Describe any adjustments made to reconcile such differences when calculating rates.

HREA Response:

In general, the HECO study underestimates the amount of costs involved to market, permit and install a Bergey 10 kW in Hawaii. Our estimates take into account first-hand knowledge of the costs to install these turbines here. That is, we did NOT start with mainland-based costs and then adjust to Hawaii, we started with Hawaii-based costs. In actuality, it could turn out that some installations in Hawaii could be closer to \$8,000/kW for those customers that ultimately choose to go with taller towers (we assumed the 60ft tower in our analysis) and unguyed towers. However, we stand on our assessment as provided in our January 21, 2010 filing, that the Bergey 10kW wind turbine installed on a 60ft guyed tower represents an "average" cost for typical installations in Hawaii.

Permitting costs are higher in Hawaii than in the Pacific Northwest. In fact, we now see potential differences in permitting costs across HECO's service territory that could be deal breakers. To be clear, the Commission provided guidance that all costs should be based on installing and operating wind systems on Oahu. However, we believe that costs on the Big Island could be significantly higher due to new permitting requirements. Subject to further review, we understand that wind projects on private agricultural land of a certain size will require a Special Use Permit ("SUP") from the County of Hawaii. We understand from one new project application for a 100 kW¹ project, the project will need a SUP.

¹ As of this writing, we are not sure if smaller projects, such as a 10 kW project would require a SUP.

Given the amount of due-diligence that would be required (see also our response to PUC-IR-336), preparation and securing of a SUP could easily require \$100K. Thus, if a FiT payment rate were to be designed without including these additional costs, it could be a deal breaker.

Therefore, subject to further review and analysis, HREA respectfully requests that the Commission reconsider its decision not to approve island-specific rates during the first phase of the Fit program implement. To be clear, we can provide upon request, under protective cover, detailed information to support a request for higher FiT payment rate for Tier 2 projects on the Big Island. In closing, this consideration includes not only resolution of the contribution of increased permitting costs, but also potential IRS costs as discussed in PUC-IR-336.

This concludes our response to these PUC IRs.

DATED: March 10, 2010, Honolulu, Hawaii


President, HREA

CERTIFICATE OF SERVICE

The foregoing HREA Response to IRs from NRRI and NREL on behalf of the Commission was served on the date of filing by Hand Delivery or electronically transmitted to each such Party as follows.

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